

**REMARKS**

Claims 1-31 are active in this application. Claims 9-17 and 20 stand withdrawn from consideration as being drawn to non-elected subject matter.

Applicants respectfully request reconsideration of the application, in view of the following remarks.

Esch et al (US 5,846,506) in view of Boyer et al (US 5,935,543) or Luginsland (US 2002/0022693) fail to disclose or suggest a precipitated silica as claimed in **Claim 1** which has the following physical and chemical properties:

CTAB surface area	100-200 m <sup>2</sup> /g,
BET/CTAB ratio	0.8-1.05,
DBP value	210-280 g/(100 g),
Sears value V <sub>2</sub>	10-30 ml/(5 g),
Moisture level	4-8% , and

**Ratio of Sears value V<sub>2</sub> to**

**BET surface area                    0.150 to 0.370 ml/(5m<sup>2</sup>).**

The specification states at page 5, line 27 to page 6, line 7, that:

The precipitated silicas of the invention have not only a **high absolute number of silanol groups (Sears value V<sub>2</sub>)**, but also, when comparison is made with prior-art precipitated silicas, **a markedly increased ratio of the Sears value V<sub>2</sub> to the BET surface area**. This means that the precipitated silicas of the invention in particular have a very high number of silanol groups based on the total surface area.

The precipitated silicas of the invention have not only an increased number of silanol groups but also low microporosity, i.e. a **very low ratio of BET to CTAB**.

**The combination of the features** mentioned, in particular the high ratio of Sears value V<sub>2</sub> to BET, gives the precipitated silicas of the invention excellent suitability as reinforcing fillers for elastomers. These precipitated silicas of the invention have increased rubber activity, and exhibit very good dispersion behavior and a low vulcanization time.

Emphasis added.

Esch et al (US 5,846,506) in view of Boyer et al (US 5,935,543) or Luginsland (US 2002/0022693) do not disclose the **combination of the features** mentioned, in particular the high ratio of Sears value  $V_2$  to BET, which gives the precipitated silicas of the invention excellent suitability as reinforcing fillers for elastomers.

The claimed precipitated silicas have a ratio of Sears value  $V_2$  to BET surface area is 0.150 to 0.370 ml/(5m<sup>2</sup>). This correlates to a very high number of silanol groups based on the total surface area. (See the specification at page 5, line 27 to page 6, line 7).

Esch disclose an absolute range for the BET surface of 35 to 350 m<sup>2</sup>/g and an absolute number of silanol groups, i.e. silanol group range of 6 to 20. See col. 1, table.

As can be calculated from the examples of Esch, the ratio of Sears number / BET, i.e. the relative silanol group density, is in a range between **0.076 and 0.1125** and thus lower than the claimed **0.150 to 0.370**. The highest relative silanol group density disclosed in Esch is 0.1125 which is about 25% lower than the lowest limit in the present claims.

The Examiner argues that by dividing the broad silanol group number and the broad BET number disclosed at col. 1, one would arrive at the claimed ratio. The Examiner also contends that only Example 3 (col. 7) has values for BET and Sears number. See pages 4 and 5 of the Office Action of January 7, 2008.

Each of the examples 1, 2 and 3 of Esch (US 5,846,506) discloses the BET and Sears value. The N<sub>2</sub> surface area is the BET. The Examples 4-12 use the silicas of Examples 2 or 3. Example 5 of Esch shows a comparison of BET to Sears number of the Examples of Esch and all state of the art silica, accordingly the state of the art silica have a Sears/BET ratio far

below 0.170, too.

Even if the broad ranges of col. 1 of Esch are used to calculate the Sears/BET ratio, if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus. *Id.* See also *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); MPEP § 2144.08.

Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). see also *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004). See MPEP 2144.05 III.

Applicants have prepared a comparative Example comparing the silicas of the present invention with those of Example 3 of Esch (Example 3 of Esch is a commercial product "Ultrasil 3370", i. e. the most important Example of Esch and the closest prior art). A **Rule 132 Declaration** is attached herewith.

The Rule 132 Declaration provides a comparison experiment in which the properties of the silica according to Example 3 of Esch (US 5,846,506) are compared with those of the silica III of the Examples of the present invention (see page 35, starting at line 30 of the specification).

The precipitated silicas of the present invention have clearly improved processing properties because of the higher ratio of Sears number to BET. In other words, using the silicas of the present invention leads to drastically shorter vulcanization times, greater vulcanization rates and lower Mooney viscosities.

The comparison example therefore confirms the statements starting at page 16, line 28 of the specification, according to which the increased number of silanol groups per m<sup>2</sup> of surface area leads to improved and better binding of the coupling agent (silane). The comparison example clearly demonstrates the relevance of the ratio of Sears number to BET and also shows that this parameter leads to a considerable improvement in performance of the silica of the present invention compared with the silica of US 5,846,506.

Boyer et al and Luginsland do not cure the defects of Esch et al as they do not disclose the combination of the features mentioned, in particular the high ratio of Sears value V<sub>2</sub> to BET, which gives the precipitated silicas of the invention excellent suitability as reinforcing fillers for elastomers.

Therefore, the rejection of Claims 1-8, 18-19 and 23 under 35 U.S.C. § 103(a) over Esch et al (US 5,846,506) in view of Boyer et al (US 5,935,543) and the rejection of Claims 1-8, 18-19, 21 and 23-29 under 35 U.S.C. § 103(a) over Esch et al (US 5,846,506) in view of Luginsland (US 2002/0022693) are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of these rejections is respectfully requested.

The **provisional** double patenting rejection of Claims 1-8, 18-19, 23 and 27 over Claims 1-9, 16-18 and 21 of co-pending application Serial No. 10/542,763, is traversed.

Application No.: 10/542,850  
Reply to Office Action of: January 7, 2008

The claims of Serial No. 10/542,763 do not disclose the **combination of the features** claimed, which gives the precipitated silicas of the invention excellent suitability as reinforcing fillers for elastomers. Thus, this rejection should be withdrawn.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

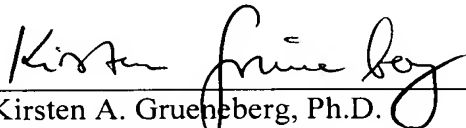
Respectfully submitted,

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